

The plan heretofore pursued has been the construction of levees high enough and strong enough to confine all of the flood waters within the river channels. The levees that have been constructed are not sufficiently high for such floods as are now predicted. * * * Insufficient room was left in the river for the passage of the unprecedented volume of flood water. The levees must be strengthened, but a halt must be called on further material increase in their heights and the consequent threat to the inhabitants of the areas they are built to protect.

Man must not try to restrict the Mississippi River too much in extreme flood. The river will break any plan which does this.

The plan recommended provides the requisite space for the passage of floods, and levees of adequate strength to withstand them. * * *

NEW THREE-CUP ANEMOMETER

The new three-cup anemometer has been furnished to each first-order station in continental United States. These instruments were put into use as station anemometers beginning with January 1, 1928.

This anemometer runs so close to the true velocity of the wind that errors in the anemometer itself are smaller in magnitude than errors from other sources, such as those due to exposure, variability in velocity during the time period chosen, the mechanical condition of the anemometer, and limitations in making and interpreting the record. Hence, the indicated values from the new instrument will be recorded, reported, and published without correction. A brief description of the instrument is published in the MONTHLY WEATHER REVIEW for April, 1924, pages 216-218.

At evaporation stations where, because of the location of the anemometer near the ground, the velocities are so low as to be practically the same from either the four-cup or the three-cup instrument, the four-cup instrument will be continued.

HOW SUNSPOTS ACT AS REFRIGERATORS¹

[Reprinted from the Literary Digest, January 21, 1928, p. 36]

It seems to be the fashion to blame sunspots for the weather. It is true that the researches of Abbot and his coworkers appear to indicate that the sun gives off a slightly greater amount of heat when spots are most numerous, but the observations are delicate and the reality of the phenomenon may still be questioned by some. Other attempts to correlate the spots with rainfall have led to conflicting results and, though men have seriously tried to figure a relation between sunspots and the trend of stocks, the price of wheat, famines, etc., it should be obvious that if so direct an effect as rainfall is uncertain, secondary effects would be even less connected. It is not impossible that the yearly average rainfall of the entire earth may some day be found dependent upon the frequency of sunspots, but as to local conditions, the possibility of predicting the weather from the spot configurations, we are more than skeptical—frankly unbelieving.

SNOW AND A COLD WAVE IN EUROPE DECEMBER 18-23, 1927

Coincidentally with the occurrence of a cold wave in Europe on the dates above mentioned, there was an exceptionally large depression of the barometer over the North Atlantic, apparently extending from Newfoundland to Portugal, or it may be that a greater number of meteorological reports would have shown the presence of a series of great barometric depressions in tandem; in any event, the contrast between the pressure over the ocean and the land was unusually great.

It is a rather common experience to find in the Pacific Ocean a great barometric depression coincidentally with the presence of a great anticyclone over continental United States. During the period above mentioned there was a fairly intense cyclone centered over the Gulf of Alaska, but high pressure over the continent prevented its advance inland. The weather in the

United States during the cold wave in Europe changed but little, high pressure dominating throughout the period.—A. J. H.

THE INFLUENCE OF FORESTS ON RAINFALL AND RUN-OFF¹

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[Reprinted from Meteorological Magazine, December, 1927]

Of the water vapor which is condensed as rainfall over the land, about two-thirds is provided by evaporation over the oceans, and the remaining third by evaporation and transpiration over the land. The latter contribution is made up of the evaporation of rainfall intercepted by foliage, evaporation from the soil, and transpiration, and estimates are made of these three factors for forests, crop or grass land, and bare soil. The figures are expressed as percentages of an average rainfall of 30 inches a year; for forests they give interception, 15; evaporation from soil, 7; transpiration, 25; total, 47 per cent. For crops evaporation from soil, 17; transpiration, 37; total, 54 per cent. For bare soil, evaporation, 30 per cent. Thus, the replacement of forests by crops would tend to increase the supply of moisture to the air, and, therefore, the general rainfall slightly; replacement by bare soil would decrease the general rainfall slightly. The changes in the run-off are likely to be more noticeable; replacement of forests by crops would decrease the run-off by 15 per cent, and make it less regular; replacement by bare soil would increase the run-off, but would make it highly irregular. A forest 30 feet high may be considered as adding about 30 feet to the effective height of the ground, and this should increase the local orographical rainfall by 1 or 2 per cent. Data obtained in various localities were examined in detail. At Mauritius, deforestation has resulted in a decrease by 2 or 3 per cent, while in Sweden, Germany, and India the rainfall at forest stations is about 1 per cent greater than that at neighboring stations in the open, after making allowance for differences of exposure. The question of fog and dew was also examined, and it was found that under average conditions their total effect is slight.

METEOROLOGICAL SUMMARY FOR SOUTHERN SOUTH AMERICA, NOVEMBER, 1927

By J. BUSTOS NAVARRETE, *Director*

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Atmospheric circulation showed but little activity in November. In the central region the weather was very variable, with much cloudiness and morning fog on the coast. Rains were infrequent in the south; the storms developed, as usual, in the region from Valdivia to Chiloe and at times extended as far as Concepción and Maule.

The most important anticyclones, accompanied by fair weather in the south, strong south winds on the coast between Chiloe and Arauco, and general fall in temperature, were those of the 1st-3d, 6th-13th, and 19th-25th. The second of these developed in the region of Juan Fernandez, moved toward Chiloe, and then recurved toward the Atlantic coast over Neuquen, Bahia Blanca, and Buenos Aires.

Small depressions were frequent on the coasts of the middle region and the Province of Coquimbo; important depressions accompanied by strong winds and rain crossed the southern region between the 4th and 6th and about the 11th.

¹ The Literary Digest of Jan. 21, 1928, quoting from Dr. Donald H. Menzel, of Lick Observatory, in one of the leaflets of the Astronomical Society of the Pacific, remarks upon the very great contrast in temperature between the temperature of the photosphere and that of the spot itself, viz, about 2,000 deg. (absolute) lower. The excerpt which we print below will doubtless be of interest to our readers.—Editor.

¹ The full article of which the following is an abstract will doubtless appear in a forthcoming number of the Quarterly Journal of the Royal Meteorological Society, 49 Cromwell Road, London, S.W. 7.